Amendments to the Claims

The listing of claims below will replace all prior versions and listings of claims in the present application.

Claim Listing

1.   (New) An apparatus comprising:
a network interface element configured to receive an inbound packet at a line rate; and
a control element coupled to said network interface element and configured to
      determine a packet priority associated with said inbound packet substantially
      at said line rate.

2.   (New) The apparatus of claim 1, wherein
said control element comprises,
      a first buffer configured to store said inbound packet, and
      an inbound queue manager configured to store at least a portion of said
            inbound packet using a second buffer; and
said second buffer is substantially larger than said first buffer.

3.   (New) The apparatus of claim 2, wherein said control element comprises:
a control element configured to perform rate limiting on a plurality of packets
      including said inbound packet substantially at said line rate.

4.   (New) The apparatus of claim 2, wherein said inbound queue manager
comprises a buffer usage manager.

5.   (New) The apparatus of claim 2, wherein said control element comprises:
a control element configured to determine a class of service associated with said
      inbound packet.

6.   (New) The apparatus of claim 5, wherein

said inbound packet comprises a header and a tail; and

said control element further comprises:

     an inbound receiver comprising said first buffer;

     a lookup circuit coupled to said inbound receiver and configured to compare
          said header to a data structure and to determine routing information;
          and

     a first packet modifier circuit configured to modify said header according to at
          least said routing information to form a modified packet;

7.   (New) The apparatus of claim 6, wherein said inbound queue manager

comprises:

     an inbound queue manager coupled to said first packet modifier circuit and configured
          to store said modified packet using said second buffer.

8.   (New) The apparatus of claim 6, wherein said data structure comprises an M-

way branching tree structure.

9.   (New) The apparatus of claim 2, wherein said control element further

comprises:

     an outbound receiver comprising a third buffer configured to store an outbound packet
          substantially at said line rate;

     a second packet modifier circuit configured to modify said outbound packet
          substantially at said line rate; and

     an outbound queue manager coupled to said second packet modifier circuit and
          configured to store said outbound packet using a fourth buffer, wherein
          said fourth buffer is substantially larger than said third buffer.

10.   (New) A method comprising:

storing an inbound packet using a network interface; and

determining a packet priority associated with said inbound packet substantially at a
          line rate of said network interface.

11.   (New)The method of claim 10, wherein said storing comprises:

storing an inbound packet using a first buffer of said network interface.

12.   (New) The method of claim 11, further comprising:

storing at least a portion of said inbound packet using a second buffer of said network
interface in response to said determining, wherein
said second buffer is substantially larger than said first buffer.

13.   (New) The method of claim 12, further comprising:

performing rate limiting on a plurality of packets including said inbound packet
substantially at said line rate of said network interface.

14.   (New) The method of claim 12, wherein said determining comprises:

determining a class of service associated with said inbound packet.

15.   (New) The method of claim 14, wherein

said inbound packet comprises a header and a tail; and

said method further comprises:

comparing said header to a data structure substantially at said line rate of said
network interface;

determining routing information substantially at said line rate of said network
interface; and

modifying said header according to at least said routing information to form a
modified packet substantially at said line rate of said network interface.

16.   (New) The method of claim 15, wherein said comparing comprises:

comparing said header to an M-way branching tree structure.

17.   (New) The method of claim 15, wherein said storing at least a portion of said
inbound packet using a second buffer of said network interface in response to said
determining comprises:

storing said modified packet using said second buffer.

18.   (New) The method of claim 17, wherein said storing said modified packet using said second buffer comprises:

managing buffer usage.

19.   (New) The method of claim 12, further comprising:

storing an outbound packet using a third buffer of said network interface;

modifying said outbound packet substantially at said line rate of said network interface; and

storing said outbound packet using a fourth buffer of said network interface in response to said modifying, wherein

said fourth buffer is substantially larger than said third buffer.

20.   (New) A machine-readable medium having a plurality of instructions executable by a machine embodied therein, wherein said plurality of instructions when executed cause said machine to perform a method comprising:

storing an inbound packet using a network interface; and

determining a packet priority associated with said inbound packet substantially at a line rate of said network interface.

21.   (New) The machine-readable medium of claim 20, wherein said storing comprises:

storing an inbound packet using a first buffer of said network interface.

22.   (New) The machine-readable medium of claim 21, said method further comprising:

storing at least a portion of said inbound packet using a second buffer of said network interface in response to said determining, wherein

said second buffer is substantially larger than said first buffer.

23.   (New) The machine-readable medium of claim 22, said method further comprising:

performing rate limiting on a plurality of packets including said inbound packet substantially at said line rate of said network interface.

24.   (New) The machine-readable medium of claim 22, wherein said determining comprises:

determining a class of service associated with said inbound packet.

25.   (New) The machine-readable medium of claim 24, wherein

said inbound packet comprises a header and a tail; and

said method further comprises:

comparing said header to a data structure substantially at said line rate of said network interface;

determining routing information substantially at said line rate of said network interface; and

modifying said header according to at least said routing information to form a modified packet substantially at said line rate of said network interface.

26.   (New) The machine-readable medium of claim 22, said method further comprising:

storing an outbound packet using a third buffer of said network interface;

modifying said outbound packet substantially at said line rate of said network interface; and

storing said outbound packet using a fourth buffer of said network interface in response to said modifying, wherein

said fourth buffer is substantially larger than said third buffer.

27.   (New) An apparatus comprising:

means for storing an inbound packet using a network interface; and

means for determining a packet priority associated with said inbound packet substantially at a line rate of said network interface.

28.   (New) The apparatus of claim 27, wherein said means for storing comprises:

means for storing an inbound packet using a first buffer of said network interface.

29.   (New) The apparatus of claim 28 further comprising:

means for storing at least a portion of said inbound packet using a second buffer of

said network interface, wherein

said second buffer is substantially larger than said first buffer.

30.   (New) The machine-readable medium of claim 29, further comprising:

means for performing rate limiting on a plurality of packets including said inbound

packet substantially at said line rate of said network interface.

31.   (New) The apparatus of claim 29, wherein said means for determining

comprises:

means for determining a class of service associated with said inbound packet.

32.   (New) The apparatus of claim 31, wherein

said inbound packet comprises a header and a tail; and

said apparatus further comprises:

means for comparing said header to a data structure substantially at said line

rate of said network interface;

means for determining routing information substantially at said line rate of

said network interface; and

means for modifying said header according to at least said routing information

to form a modified packet substantially at said line rate of said network

interface.

33.   (New) The apparatus of claim 29, further comprising:

means for storing an outbound packet using a third buffer of said network interface;

means for modifying said outbound packet substantially at said line rate of said

network interface; and

means for storing said outbound packet using a fourth buffer of said network interface

in response to said modifying, wherein

said fourth buffer is substantially larger than said third buffer.